MultiConnect™ SS

Serial-to-Serial Device Server

User Guide

MultiConnect™ SS User Guide
Serial-to-Serial Device Server (MTS2SA-T & MTS2SA-T-R)

PN S000354C, Version C

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Revisions

Revision Level	*Date*	*Description*
A	07/12/04	Initial release for Serial-to-Serial adapter.
B	05/11/05	Added more graphics to Connections sections. Added more power pin text. Removed the Command Line Interface section and the Application Examples from this document. Users should see the the common Command Line Interface and Application Examples (S000368x).
C	01/30/08	Updated the Technical Support section. Changed the panel mounting screw separation measurement. Updated the Warranty and Repairs Statement. Added the WEEE Directive.

Trademarks

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Patents

This device is covered by one or more of the following patents: 6,031,867; 6,012,113; 5,628,030; 5,450,425. Other patents pending.

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Chapter 1 – Product Description & Specifications

Product Description

The MultiConnect serial-to-serial device server enables installed serial devices to connect to the Internet for remote monitoring, control and configuration.

Internet-Enable Any Device. The MultiConnect provides the powerful ability to IP-enable serial devices allowing more options for data acquisition, device management, and industrial control than would otherwise be available.

Simply install the MultiConnect between a serial device and an analog, ISDN, or wireless modem to send and receive data over the Internet. It can also serve as a single Web page in response to a Web browser request.

Reduces Development Time. MultiConnect can make your existing and next generation serial device IP-ready without requiring hardware changes to its design. MultiConnect actually provides faster time-to-market because it relieves the burden and expense of writing and maintaining Internet applications. The complete, ready-to-integrate MultiConnect allows you to enhance your product while you focus on developing its core features.

Management and Configuration. MultiConnect has several means of management and configuration built into the design. It supports remote configuration, which means you can have central site setup and control of the remote MultiConnect device servers via the command line interface or telnet.

Applications

The MultiConnect will IP-enable any device to provide remote monitoring, control and configuration of any system. The solution is ideal for the following applications:

- Appliances
- ATM terminals
- Credit card and check verification systems
- Data collection
- Gas pumps
- Industrial and medical remote monitoring systems
- Point-of-sale terminals
- Remote diagnostics
- Remote metering
- Security systems
- Ticketing machines
- Vending/gaming machines
- And more…..

Product Builds

Product	Description	Region
MTS2SA-T	Serial-to-Serial + IP (External Power)	Global
MTS2SA-T-R	Serial-to-Serial + IP (RS-232 Power)	Global
Note: The **MTS2SA-T-R (RS-232 Powered)** requires power to be supplied into Pin 6 of the female DB9.		

Package Contents

- One MultiConnect Device Server
- One universal power supply with power cord included with the externally powered device server
- One RS-232 cable included with the RS-232 Serial-to-Serial device server
- One mounting bracket
- Four adhesive-backed rubber feet (table-top mounting)
- One Quick Start Guide
- One MultiConnect CD

Handling Precautions

All devices must be handled with certain precautions to avoid damage due to the accumulation of static charge. Although input protection circuitry has been incorporated into the devices to minimize the effect of this static buildup, proper precautions should be taken to avoid exposure to electrostatic discharge during handling and mounting.

Specifications

Category	Description
Memory	8 MEG
Flash Memory	2 MEG
Protocols Supported	ARP, DHCP, FTP, HTTP, ICMP, IP, POP3, PPP, SMTP, TCP, Telnet, TFTP, and UDP
Serial Interface	Standard DCE serial
Data Formats	Serial, binary, asynchronous
Data Rates	300; 1200; 2400; 4800; 9600; 19200; 38400; 57600; 115200; 230400 bps
Flow Control	RTS/CTS (hardware)
Management	Serial; Telnet
Security	Username and password authentication using local database
System Software	Flash ROM standard: downloadable from a TCP/IP host (TFTP) or Xmodem via Serial
LEDs	ACT (Activity) and STS (Status)
Ethernet	IEEE 802.3
Power Requirements	**With External Power (MTS2SA-T) Power Consumption** @ 9V DC: Typical 240mA Maximum 250mA **With RS-232 Power (MTS2SA-T-R) Power Consumption** @ 5V DC: Typical 95mA Maximum 105mA @ 10V DC: Typical 50mA Maximum 60mA @ 15V DC: Typical 35mA Maximum 45mA @ 20V DC: Typical 28mA Maximum 38mA @ 25V DC: Typical 24mA Maximum 34mA
Operating Temperature	32° to +120°F (0° to 50°C); humidity range 25-85% (non-condensing)
Storage Temperature	-40°C to +85°C
Physical Dimensions	3.5" w x 2.1" h x 0.98" d; 3.4 oz. 8.8 cm x 5.3 cm x 6 cm; 96 g
Certifications	**Safety Certifications:** UL60950 cUL60950 EN60950 ACA TS001 / AS 3260 **EMC Safety Approvals:** FCC Part 15 Class A EN55022 EN55024 **CE Marked**
Features	Serial interface supports DTE speeds to 230K bps Embedded TCP/IP stack External and RS-232 power options High performance processor runs ARP, DHCP, FTP, HTTP, ICMP, IP, POP3, PPP, SMTP, SNMP, SNMP, TCP, Telnet, TFTP, UDP protocols Command line interface Flash memory to update firmware with the latest enhancements Flexible IP protocol stack Compact, rugged industrial chassis design Desktop or panel mounting Two-year warranty

Category	Description
Software Features	**Internet Applications** **DHCP Client:** Request IP address for Ethernet Interfaces **Telnet Server:** Command Line Configuration Auto Dial-out Feature Command line via custom port (other than standard port 23) **Telnet Client:** Connect to remote Telnet Server Serial Auto Dial-in Feature **Terminal Server:** Network to Serial Connectivity Serial to Network Connectivity **TFTP Server:** Flash Upgrade **SMTP Client:** The email client embedded in the MultiConnect sends email to the configured recipients. **POP3 Client:** The email client embedded in the MultiConnect receives email from the POP3 Server. This feature is useful for field upgrades. Firmware upgrades can be sent as attachments. **HTTP Server:** To host Web pages on behalf of the serial device for monitoring and configuration of the serial device. **Functional Features** **Command Line Configuration over Serial or Ethernet** Serial **-** TTY Ethernet **-** Telnet **Username and Password Authentication Using Local Database** The Username and Password can be created using commands. The User database authenticates the Users before access to command mode of the MultiConnect is enabled. **Remote Transparent Bridging** Ethernet to Serial Bridging **Point-to-Point Protocol (PPP)** Negotiations Bridging Control Protocol **-** 802.3 MAC Type CCP Compression

LED Indicators

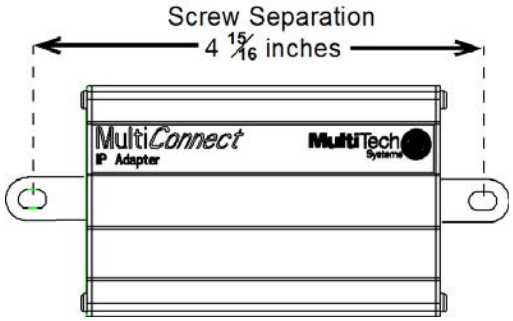
Name	Description
ACT	Activity – Lit when data is being transmitted or received.
STS	Status – Blinks to indicate that the unit is functioning.

Chapter 2 – Installation

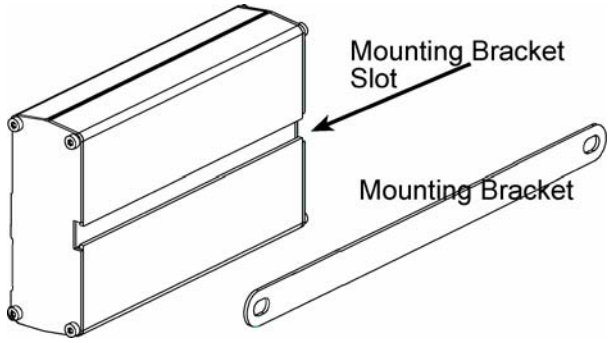
Attaching the MultiConnect to a Fixed Location

The MultiConnect device server is design to be used on the desktop or to be panel-mounted. To attach the bracket for panel-mounting, following these steps:

1. Typically, the MultiConnect device server is mounted against a flat surface with two mounting screws. Drill the mounting holes at the desired location. The mounting holes must separated by 4 -15/16 inches center-to-center.



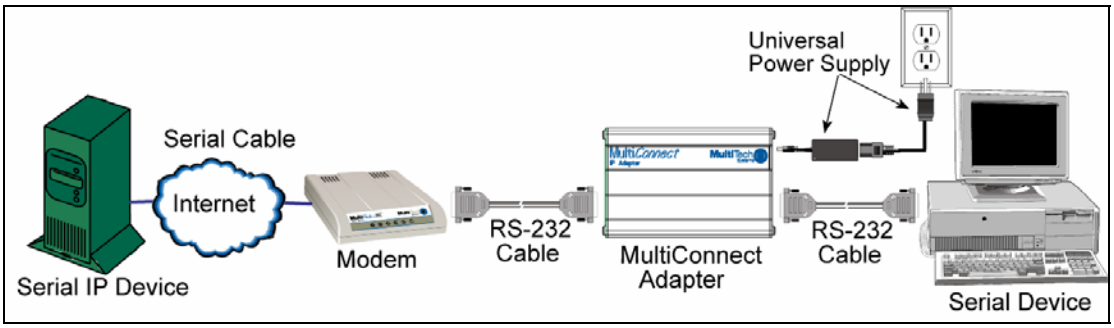
2. To attach the brackets to the MultiConnect, slide the mounting brackets into the corresponding slots on the back of the MultiConnect chassis.



3. Attach the device server to the surface with two screws.

Serial-to-Serial Installation

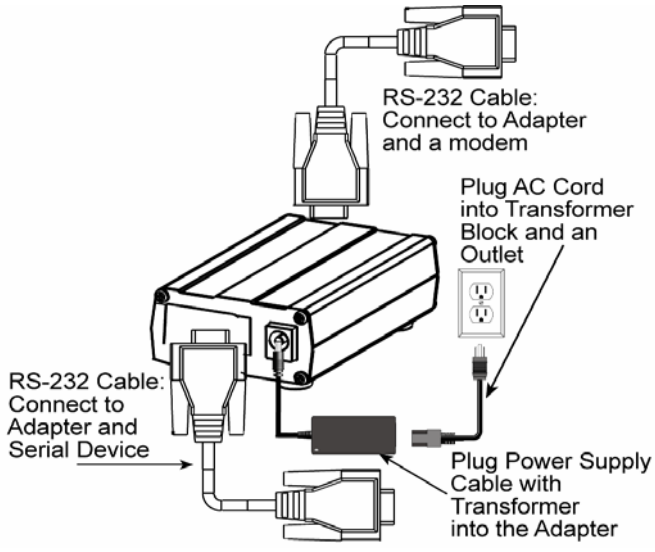
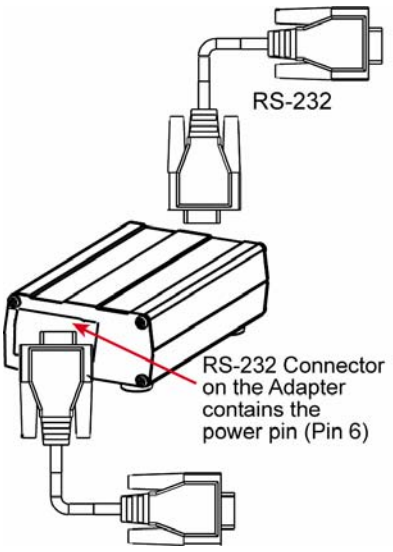
This is an example of a typical setup.



Connecting the Cables

Serial-to-Serial Power Connections

Powered in one of two ways:

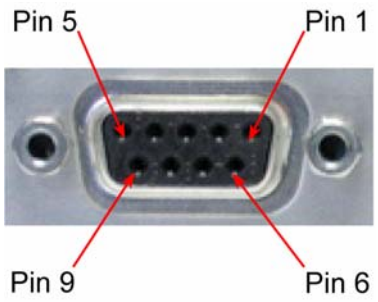
Powered by External Power Supply MTS2SA-T	Powered through RS-232 Cable (Pin 6) MTS2SA-T-R
RS-232 Connector  **RS-232 & External Power Connectors**	**RS-232 Connector**  **RS-232 Power Pin Connector**

Pin Functions of the Female End Connector

The following tables explain the pin functions.

External Power	
Signal	**IN/OUT**
Pin 1 CD	O
Pin 2 TX	O
Pin 3 RX	I
Pin 4 DTR	I
Pin 5 GND	--
Pin 6 DSR	**O**
Pin 7 CTS	I
Pin 8 RTS	O
Pin 9 RI	O

Multi-Tech
MultiConnect
Female Connector



Powered Through Pin 6	
Signal	**IN/OUT**
Pin 1 CD	O
Pin 2 TX	O
Pin 3 RX	I
Pin 4 DTR	I
Pin 5 GND	--
Pin 6*	**Power**
Pin 7 CTS	I
Pin 8 RTS	O
Pin 9 RI	O

***Pin 6 Input Power Consumption**		
@ 5V DC:	Typical 190mA	Maximum 245mA
@ 10V DC:	Typical 100mA	Maximum 120mA
@ 15V DC:	Typical 69mA	Maximum 83mA
@ 20V DC:	Typical 54mA	Maximum 65mA
@ 25V DC:	Typical 45mA	Maximum 55mA

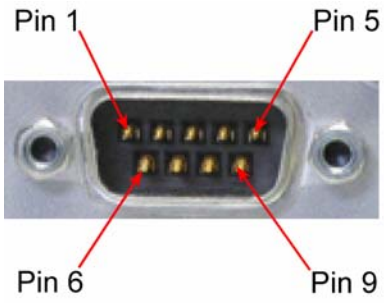
Warning:
When supplying power to the RS-232 connector, make sure the power does not feed the DTE device.

Pin Functions of the Male End

The following table explains the pin functions.

RS-232	
Signal	**IN/OUT**
Pin 1 CD	I
Pin 2 RX	I
Pin 3 TX	O
Pin 4 DTR	O
Pin 5 GND	-
Pin 6 DSR	I
Pin 7 RTS	O
Pin 8 CTS	I
Pin 9 RI	I

Multi-Tech
Male Connector



Chapter 3 – Managing and Configuring the MultiConnect

Two Ways to Login

Login Using TTY

- Use TTY to configure your MultiConnect for the first time. Configure the host serial port using the defaults listed below:

  Baud: 115.2K
  Data: 8
  Parity: N
  Stop: 1
  Flow-Control: None

- Press the Enter key three times to get to the Login prompt or send three carriage returns.
- At the Login prompt, type *admin*.
  At the Password prompt, type *admin*.

Important: The user name and password are case sensitive. They must be typed in lowercase letters.

Login Using Telnet through the PPP Interface

- Open the PPP interface on the modem port.
- Upon successful establishment of a Telnet session, the MultiConnect displays the Login prompt.
  At the Login prompt, type *admin*.
  At the Password prompt, type *admin*.
- After a successful login, the MultiConnect IP enters **Command Mode**. In Command Mode, the MultiConnect can be configured and managed using the Command Line Interface (CLI) command set.

About Command Mode and Data Mode

- In **Command Mode**, a # sign designates the prompt. If you type the word **Help** at the command prompt, a complete list of commands displays.
- If you type the word **Usage** at the command prompt, a list of the command semantics displays.
- In **Data Mode,** the # sign is not displayed.
- To leave Command Mode, exit your terminal or Telnet session or type the word **Exit** at the command prompt.

Note: See the **Restore** command and **IP Escape String** command.

Chapter 4 – Command Line Interface and Application Examples

See the separate Command Line Interface and Application Examples guide. The guide includes the commands and examples for managing and configuring your MultiConnect device server.

For your convenience, we have also provided a reference guide of modem AT commands.

These guides are available on the MultiConnect CD and on the Multi-Tech Web site.

Chapter 5 – Setting Country or Region Codes Using the CLI

The Default Country or Region Code is B5.
If You Want to Change the Country or Region Code, Use the Command Line Interface:

Command Syntax	set serial s1 modem country-code value <value>
Description	Sets the modem country/region code value to <value>. This command is valid only for port s1. Applicable only if the country-code type is set to **code.**
Default Value	-
Success	OK
Error	**1. Too few arguments** "Usage: set serial s1 modem country-code value <value> Type 'set serial s1 modem country-code value ?' for more information" **Note:** There is no validation on the country/region code value.

To View Country or Region Code:

Command Syntax	show serial modem country code This command is supported on s1 only.
Description	Displays the supported country/region codes for this product.
Default Value	-
Success	OK
Error	**1. Too few arguments** Possible value(s) are configuration chat-script country/region code modem-configuration statistics

Country or Region Codes – A list of thcountry or region code settings for the countries/regions that Multi-Tech currently supports is available on the Multi-Tech Web site at:

http://www.multitech.com/PRODUCTS/Categories/External_Device_Networking/global_modems/configuration.asp#chart

Chapter 6 – Flash Upgrade

Introduction

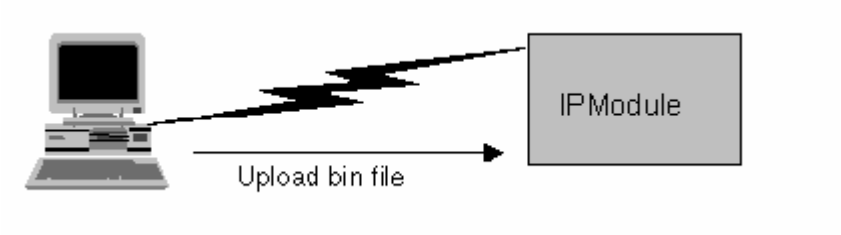
The MultiConnect device server contains a 2 MB flash wherein the boot image, the firmware and configuration files are stored in a compressed format.

Serial Flash Upgrade Scenario

Following steps explain the procedure to upgrade a flash using the serial COM port (serial flash upgrade).

Connect the MultiConnect to a PC COM Port.

- Open an application through which we can access the serial device(e.g., Meterm, zoc, hyperterm).
- Reboot the MultiConnect.
- Wait for the boot message and prompt “press d to download” to appear.
- Press **d** when prompted.
- Select the **XMODEM** Protocol from the Terminal application.
- Choose a file (MTXCSEM-TFTP-…) file to be uploaded.
- Perform a file upload.



The MultiConnect reboots and will be up after a few seconds (10-15 secs).

The MultiConnect reboots after it has been successfully upgraded.

Appendix A – Regulatory Information

Regulatory Information

FCC Part 15 Regulation

This equipment has been tested and found to comply with the limits for a **Class A** digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient or relocate the receiving antenna.

Increase the separation between the equipment and receiver.

Plug the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC rules. Operation of this device is subject to the following conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference that may cause undesired operation.

WARNING – Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Industry Canada

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du Reglement Canadien sur le matériel brouilleur.

CE

EMC, Safety, and Directive Compliance

The CE mark is affixed to this product to confirm compliance with the following European Community Directives:

Council Directive 89/336/EEC of 3 May 1989 on the approximation of the laws of Member States relating to electromagnetic compatibility;

and

Council Directive 73/23/EEC of 19 February 1973 on the harmonization of the laws of Member States relating to electrical equipment designed for use within certain voltage limits.

Appendix B – Warranty and Service

Multi-Tech Warranty Statement

Multi-Tech Systems, Inc., (hereafter "MTS") warrants that its products will be free from defects in material or workmanship for a period of two, five, or ten years (depending on model) from date of purchase, or if proof of purchase is not provided, two, five, or ten years (depending on model) from date of shipment.

MTS MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED.

This warranty does not apply to any products which have been damaged by lightning storms, water, or power surges or which have been neglected, altered, abused, used for a purpose other than the one for which they were manufactured, repaired by Customer or any party without MTS's written authorization, or used in any manner inconsistent with MTS's instructions.

MTS's entire obligation under this warranty shall be limited (at MTS's option) to repair or replacement of any products which prove to be defective within the warranty period or, at MTS's option, issuance of a refund of the purchase price. Defective products must be returned by Customer to MTS's factory — transportation prepaid.

MTS WILL NOT BE LIABLE FOR CONSEQUENTIAL DAMAGES, AND UNDER NO CIRCUMSTANCES WILL ITS LIABILITY EXCEED THE PRICE FOR DEFECTIVE PRODUCTS.

Repair Procedures for U.S. and Canadian Customers

In the event that service is required, products may be shipped, freight prepaid, to our Mounds View, Minnesota factory:

Multi-Tech Systems, Inc.
2205 Woodale Drive
Mounds View, MN 55112 U.S.A.
Attn: Repairs, Serial # _____

A Returned Materials Authorization (RMA) is not required. Return shipping charges (surface) will be paid by MTS to destinations in U.S. and Canada.

Please include, inside the shipping box, a description of the problem, a return shipping address (must have street address, not P.O. Box), and your telephone number. If the product is out of warranty, a payment in advance is required. Acceptable means of payment include credit card, wire transfer or a check in U.S. dollars drawn on a U.S. Bank.

For out of warranty repair charges, go to COMPANY/Policies/warranty/

Extended two-year overnight replacement service agreements are available for selected products. Please call MTS customer service at (888) 288-5470 or visit our web site at /PARTNERS/Programs/overnight_replacement/ for details on rates and coverages.

Please direct your questions regarding technical matters, product configuration, verification that the product is defective, etc., to our Technical Support department at (800) 972-2439 or email support@multitech.com. Please direct your questions regarding repair expediting, receiving, shipping, billing, etc., to our Repair Accounting department at (800) 328-9717 or (763) 717-5631, or email mtsrepair@multitech.com.

Repairs for damages caused by lightning storms, water, power surges, incorrect installation, physical abuse, or user-caused damages are billed on a time-plus-materials basis.

Repair Procedures for International Customers

(Outside U.S.A. and Canada)

Your original point-of-purchase Reseller may offer the quickest and most economical repair option for your Multi-Tech product. You may also contact any Multi-Tech sales office for information about the nearest distributor or other repair service for your Multi-Tech product. The Multi-Tech sales office directory is available at www.multitech.com/PARTNERS/Channels/offices/

In the event that factory service is required, products may be shipped, freight prepaid to our Mounds View, Minnesota factory. Recommended international shipment methods are via Federal Express, UPS or DHL courier services, or by airmail parcel post; shipments made by any other method will be refused. Please include, inside the shipping box, a description of the problem, a return shipping address (must have street address, not P.O. Box), and your telephone number. If the product is out of warranty, a payment in advance is required. Acceptable means of payment include credit card, wire transfer or a check in U.S. dollars drawn on a U.S. Bank. Repaired units shall be shipped freight collect, unless other arrangements are made in advance.

Please direct your questions regarding technical matters, product configuration, verification that the product is defective, etc., to our Technical Support department nearest you or email support@multitech.com. When calling the U.S., please direct your questions regarding repair expediting, receiving, shipping, billing, etc., to our Repair Accounting department at +(763) 717-5631 in the U.S.A., or email mtsrepair@multitech.com.

Repairs for damages caused by lightning storms, water, power surges, incorrect installation, physical abuse, or user-caused damages are billed on a time-plus-materials basis.

Repair Procedures for International Distributors

International distributors should contact their MTS International sales representative for information about the repair of Multi-Tech product(s).

Please direct your questions regarding technical matters, product configuration, verification that the product is defective, etc., to our International Technical Support department at +(763)717-5863. When calling the U.S., please direct your questions regarding repair expediting, receiving, shipping, billing, etc., to our Repair Accounting department at +(763) 717-5631 in the U.S.A. or email mtsrepair@multitech.com.

Repairs for damages caused by lightning storms, water, power surges, incorrect installation, physical abuse, or user-caused damages are billed on a time-plus-materials basis.

Replacement Parts

SupplyNet, Inc., can supply you with replacement power supplies, cables and connectors for selected Multi-Tech products. You can place an order with SupplyNet via mail, phone, fax or the Internet at the following addresses:

Mail: SupplyNet, Inc.
614 Corporate Way
Valley Cottage, NY 10989

Phone: 800 826-0279

Fax: 914 267-2420

Email: *info@thesupplynet.com*

Internet: http://www.thesupplynet.com

Appendix C – WEEE Directive (Waste Electrical and Electronic Equipment)

Introduction

The WEEE directive places an obligation on EU-based manufacturers, distributors, retailers and importers to take-back electronics products at the end of their useful life. A sister Directive, ROHS (Restriction of Hazardous Substances) complements the WEEE Directive by banning the presence of specific hazardous substances in the products at the design phase. The WEEE Directive covers all Multi-Tech products imported into the EU as of August 13, 2005. EU-based manufacturers, distributors, retailers and importers are obliged to finance the costs of recovery from municipal collection points, reuse, and recycling of specified percentages per the WEEE requirements.

Instructions for Disposal of WEEE by Users in the European Union

The symbol shown below is on the product or on its packaging, which indicates that this product must not be disposed of with other waste. Instead, it is the user's responsibility to dispose of their waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service or where you purchased the product.

July, 2005

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